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FINAL SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

OPERATIONAL IMPROVEMENTS TO OPTIMIZE SELECTIVE CATALYTIC REDUCTION SYSTEMS FOR NITROGEN OXIDE CONTROL AT ALLEN FOSSIL PLANT UNITS 1, 2, AND 3

Shelby County, Tennessee

TENNESSEE VALLEY AUTHORITY

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The Proposed Decision and Need

The Tennessee Valley Authority (TVA) proposes to improve operation of the high-dust selective catalytic reduction (SCR) systems installed on Units 1, 2, and 3 of Allen Fossil Plant (ALF) in order to optimize (e.g., achieve or exceed) expected performance levels. As designed, the three SCR units at ALF were expected to remove 90 percent of the emissions of oxides of nitrogen (NO_X) at 2 parts per million by volume (ppmv) ammonia slip (TVA 2001). Ammonia slip is the amount of unreacted ammonia from the SCR system that enters the waste stream.

A supplemental environmental assessment (EA) is needed to assess the impacts of operating SCR units at higher ammonia injection rates while still meeting the environmental requirements for NO_X reduction in the permit and the recently finalized Clear Air Interstate Rule (CAIR). Testing during the summers of 2005 and 2006 revealed that the SCR units at ALF operate at approximately 4 ppmv ammonia slip at 3 percent oxygen by volume at the SCR outlet, achieving approximately 92 percent NO_X reduction. Although the operating ammonia slip is above the level assessed in the EA for the installation of SCR systems on ALF Units 1, 2, and 3 (TVA 2001), the plant is operating in full compliance with the requisite air and water quality permits.

The more stringent requirements for NO_X reductions in CAIR will necessitate year-round operation of all of TVA's SCR systems starting in 2009. In 2007 and 2008, under CAIR, TVA and other utilities have the opportunity to earn NO_X allowances by reducing NO_X emissions prior to the 2009 compliance date. Further, prior to 2007, TVA may voluntarily elect to operate one or more SCR systems during portions of the non-ozone season of the year (October through April) to incrementally improve regional air quality and accrue NO_X allowances, which facilitates TVA's ability to maintain a flexible approach in complying with air quality requirements. Although ALF SCR systems have been operated only during the five-month ozone season (May-September), ALF has been assessed for year-round SCR operation at 2 ppmv ammonia slip (TVA 2005a). This supplemental EA will assess year-round operation of SCR Units 1, 2, and 3 at ammonia injection rates greater than 2 ppmv.

Background

ALF is located on the south side of McKellar Lake near the left bank of the Mississippi River in Shelby County, Tennessee, about 5 miles southwest of downtown Memphis. The plant has three generating units with a combined net capacity of 990 megawatts. Because each

of the seven burners at ALF is a cyclone design, ALF is a relatively high producer of NO_X emissions, producing in the range of 0.7 to 1.4 pounds of NO_X per million British thermal units (lb NO_X/10^6 Btu) absent combustion controls. The type of coal burned at ALF varies daily, ranging from 0.45 to 1.4 pounds per ton sulfur.

The NO_X reduction systems at ALF are "high-dust" SCR systems installed upstream of the electrostatic precipitators in the flue gas flow. All three units are located between the boiler outlet and the air preheater (APH). The ALF SCR systems were installed sequentially, with Unit 3 coming online in fiscal year (FY) 2001, Unit 2 in FY 2002, and Unit 1 in FY 2003. From the outset, these three systems exhibited unusual behavior. As installed, the distribution of NO_X in the system was erratic, changing minute to minute and point to point, making it difficult to tune the system for maximum performance. In spring 2005, 18 of 36 injectors were automated, facilitating fine tuning of the system on a day-to-day basis. Since then, NO_X removal at ALF has been more consistent, at approximately 92 percent.

The ammonia supply system serving the SCRs is installed west of Unit 1 between the contractor parking area and the chemical treatment pond. This system consists of an area for truck parking and unloading, storage tanks, feed pumps, and vaporizers. Additionally, a water deluge (fogging) system is installed to limit the hazard from the accidental release of anhydrous ammonia from either the storage tanks or the unloading of trucks.

The operation and environmental controls described in the ALF SCR EA (TVA 2001) are incorporated by reference into this supplemental review, except as they may be altered by the findings of this review. The catalyst used in the SCR will be replaced or rejuvenated by one of the methods described in the EA on the *Replacement or Rejuvenation of Catalyst for Selective Catalytic Reduction of Nitrogen Oxides at Seven TVA Fossil Plants in the Tennessee Valley* (TVA 2005b). The results of the 2005 catalyst rejuvenation EA are incorporated by reference into this supplemental review.

SCR Performance Testing

Testing was conducted at ALF during the FY 2005 ozone season to evaluate strategies for optimizing NO_X removal and improving equipment performance of SCR units burning low-sulfur, high-calcium coal. An increased ammonia injection rate would allow more NO_X removal and would increase the catalyst's useful life. A categorical exclusion checklist (CEC) was completed for this testing and was extended to allow for further testing in July 2006 (TVA 2006a). The tests conducted during the 2005 ozone season (TVA 2005c) concluded that:

- There is sufficient sulfur trioxide available to react with the ammonia up to a 5 ppmv ammonia slip with no significant increase in particulate emissions.

- There appears to be no environmental impact from higher ammonia slip when high Powder River Basin (PRB) coal blends are burned. The ash pond was sampled twice a week during testing, and ammonia levels remained well below the action level of 1 mg/L net increase.

- Although not fully verified, the potential to form ammonium sulfate in lieu of the more corrosive and sticky ammonium bisulfate, along with high calcium in the ash, is an indication that APH plugging is not expected to occur.

- Calculations based on the testing in 2005 indicate that the mass balance of ammonia is inverted from that described in the ALF SCR EA. Instead of 20 percent of the ammonia slip adhering to the heating surfaces in the APH and 80 percent adhering to the fly ash, the calculated results were that 70 percent of the ammonia compounds are exiting the stack while only 30 percent are being removed in the APH and precipitator. The high level of slip exiting the stack is consistent with the lab tests on PRB coal ash, which has a high calcium content, resulting in a relatively low percentage of ammonia remaining in the APH hopper ash and precipitator fly ash.

Additional ammonia slip tests were performed on July 11 and 12, 2006. The purpose of these tests was to measure the ammonia (NH_3) profile in the duct as part of an evaluation of continuous tunable diode laser NH_3 monitors. Slip measurements were taken in one of the two SCR outlet ducts for Unit 3. Test results showed that under normal operating conditions, the flow-weighted average slip of Unit 3 is on average approximately 3.5 ppmv ammonia, although individual readings were both considerably higher and lower than the average.

Other Environmental Reviews and Documentation

Development of Ash Management Strategy, Allen Fossil Plant, Shelby County, Tennessee, Final Environmental Assessment and Finding of No Significant Impact, dated August 10, 2006, Project Number 2005-90 (TVA 2006b). Six alternatives were evaluated, including three ash utilization strategies, one ash disposal strategy, and a combined alternative. The preferred approach is to use 2 million cubic yards of ash as structural fill inside the Memphis and Shelby Port Commission's Ensley Levee, avoiding the need to excavate and transport borrow soil from elsewhere. Ash may be removed from both the East and West Ash Ponds.

SCR Ammonia Slip Rate Increase Study, Shelby County, Tennessee. Categorical Exclusion Checklist Number 9749, dated April 25, 2006 (TVA 2006a).

E-Mail to Files from Ruth Horton dated July 27, 2005, "Consideration of Year-Round Operation of Selective Catalytic Reduction Systems at Current Ammonia Slip Rates for Seven TVA Fossil-Fuel Generating Plants," Project Number 2005-107 (TVA 2005a). TVA conducted a review of seven completed SCR EAs to ascertain whether year-round operation of these systems was adequately addressed in the analyses. It was determined that six of the EAs, including ALF SCR EA (TVA 2001) were adequate.

Replacement or Rejuvenation of Catalyst for Selective Catalytic Reduction of Nitrogen Oxides at Seven TVA Fossil Plants in the Tennessee Valley Final Environmental Assessment and Finding of No Significant Impact, Project Number 2004-115 (TVA 2005b). After reviewing options for rejuvenating or replacing catalyst used in SCR systems at seven TVA plants, TVA chose to maintain the flexibility to select an option from among the entire suite of proposed action alternatives, as economically and technologically appropriate to address plant-specific catalyst deactivation needs. The finding of no significant impact (FONSI) includes commitments relevant to on-site, *in situ* rejuvenation; on-site, *ex situ*; and a combination of delayed rejuvenation with on-site, *ex situ* and interim replacement with new catalyst.

Allen Fossil Plant Units 1, 2, and 3 Selective Catalytic Reduction Systems for Nitrogen Oxide Control Final Environmental Assessment and Finding of No Significant Impact,

Project Number 652 (TVA 2001). TVA considered installation of high-dust SCRs at ALF to achieve 90 percent NO_X removal by 2001 in order to meet Title 1 Clean Air Act requirements for ozone reduction. It was determined that the potential health and safety impacts from transporting, handling, and using ammonia products and residual wastes could be addressed by strict compliance with federal regulations, operation at no more than 2 ppmv slip and use of appropriate operation controls and treatment measures to meet whole effluent toxicity (WET) and effluent discharge limits in the NPDES permit.

Replacement of Catalyst for Selective Catalytic Reduction of NO_X at Allen Fossil Plant Unit 2 (Shelby County, Tennessee) and Finding of No Significant Impact, dated August 20, 2004, Project Number2004-131 (TVA 2004a). ALF Unit 2 was the first TVA generating plant where SCRs were installed and for which decisions were needed regarding management of catalyst approaching the end of its life expectancy for effectiveness,. To maintain continuity of ALF Unit 2 as a generating asset and to ensure that air emissions reductions from ALF continued to contribute to TVA system-wide targets for reductions in NO_X emissions, TVA conducted an evaluation of methods of replacing the SCR catalyst in Unit 2. The EA established TVA's ownership and ultimate disposal of the non-hazardous used catalyst, and concluded that the impacts of TVA's proposed action were insignificant.

Alternatives and Comparison

TVA is considering two alternatives to achieve optimization of NO_X reduction for Units 1, 2, and 3 at ALF. Under the No Action Alternative, TVA would be limited to operating within the parameters established in the ALF SCR EA (TVA 2001). Since 2001, operating experience has shown that achievement of the targeted NO_X reduction level of 90 percent or more requires ammonia slip levels higher than 2 ppmv. The No Action Alternative, therefore, was rejected as unresponsive to the purpose and need to achieve or exceed expected performance levels NO_X reduction in the SCR units at ALF.

The Action Alternative considers year-round operation of ALF SCR Units 1, 2, and 3 to optimize NO_X reduction through use of higher ammonia injection rates. Under this alternative, no physical changes to the SCR or supporting systems would occur. Although ammonia slip would be greater than the 2 ppmv level discussed in the ALF SCR EA (TVA 2001) and possibly over the current level of 3 to 4 ppmv, no increase of APH cleaning and no additional ammonia storage tanks would be needed. Because ALF SCR maintenance can only take place when the units are offline, there would be no NO_X emission issues during catalyst replacement outages. As planned in 2001, year-round operation would require some winterization of equipment and possible addition of some redundant equipment to allow for routine maintenance (other than the catalyst).

There would be changes in the operating strategy under the Action Alternative. Instead of maintaining slip levels below 2 ppmv as described in the ALF SCR EA (TVA 2001), the level of ammonia slip would be determined by existing permit and compliance levels:

- Ammonia-Nitrogen (Ammonia-N or NH_3-N) concentrations in the plant wastewater would not exceed the NPDES permit action limit of 1.0 mg/L net. The action limit requires TVA to notify the regulator and to take action to lower ammonia concentrations if this limit is exceeded, but does not result in a permit violation or issuance of a Notice of Violation.

- Plume opacity would be maintained below the 20 percent opacity limit.

This approach is being taken because it is difficult to reliably measure slip levels. Compounding the difficulty of tracking a specific slip target, slip rates vary with the type of coal burned. The plant routinely monitors water quality in the ash pond and opacity. Under the proposed action, slip levels would be increased only as needed to enhance NO_X reduction. A NO_X reduction efficiency of 92 percent is achievable with an approximate average slip of 3 to 4 ppmv. The plant does not anticipate a need to operate at significantly higher slip levels. Under this alternative, it is anticipated that the delivery of ammonia by truck could increase a maximum of 1 to 2 tractor trailer loads per week.

Affected Environment and Evaluation of Impacts

The ALF SCR EA (TVA 2001) discusses environmental impacts on air quality, terrestrial ecology, wetlands and floodplains, land use, visual aesthetics, noise, archaeological and historic resources, aquatic ecology, and surface water quality. It also covers the potential for environmental effects from ammonia storage and handling, accidental release of anhydrous ammonia, solid and hazardous waste, and wastewater.

Because of the nature of the proposed action (i.e., year-round operation of the SCR systems at a slip rate greater than 2 ppmv), potential environmental effects are expected to be limited to those resulting from an increased ammonia slip. During scoping, it was determined that the proposed action has the potential to affect air quality, transportation, and water/wastewater quality. There could also be potential effects from generation of additional solid and hazardous waste.

Air Quality

The air quality in the Memphis-Shelby County area, where ALF is located, is currently in attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants except for ozone, for which it is rated marginal nonattainment by the U.S. Environmental Protection Agency. The Memphis-Shelby County area is required to achieve the NAAQS for ozone by 2007. The control of NO_X emissions —a precursor to the formation of ozone— at ALF through the use of SCR units contributes towards the County's goal of achieving attainment with the ozone standard. The rate of ammonia injection in the SCR affects the control efficiency for NO_X reduction. The increase in ammonia injection feed rate would result in an increase in the reduction of NO_X emissions but can also result in the increase of ammonia slip.

Previous source testing of NO_X emissions from ALF Unit 1 with the SCR in operation (TVA 2005c) determined that the unit was achieving approximately a 92 percent reduction in NO_X emissions with an ammonia slip of approximately 4 ppmv. No exceedences of the 20 percent opacity standard have been observed during normal operation. A limited visible emission evaluations (VEE) study of the emissions from Unit 3 was conducted while the ammonia injection feed rate was increased to determine if the opacity of the plume would be affected by a higher ammonia slip rate. The VEE showed that the plume opacity could be maintained in compliance with the 20 percent opacity standard even when the NO_X reduction rate approached 98 percent at an ammonia slip above 20 ppmv. It is anticipated that an increase in ammonia slip within reasonable control limits would not interfere with the facility's ability to meet regulatory emission limits or have an adverse impact on air quality in the area.

Both ammonia and NO_X can react with other compounds in the atmosphere to form secondary particulate matter. The potential for a small increase in particulate due to

ammonia emissions would be more than offset by the decrease in particulate due to NO_X reductions associated with optimized SCR operation.

Significant production of ozone from a NO_X source does not occur until emissions reach 20 to 80 kilometers downwind of the NO_X source. However, ozone concentrations below background levels can occur immediately downwind of NO_X sources, such as power plants, due to ozone scavenging, i.e., when NO_X emissions consume ozone. The reduction of NO_X emissions may reduce the size of the area in which ozone scavenging occurs. While ozone concentrations may increase in areas previously affected by ozone scavenging, they are not expected to increase above background ozone levels.

The overall impact from optimizing the operation of the SCR control equipment should be a net improvement in air quality, both locally and regionally.

Transportation

The ALF SCR EA (TVA 2001) described the existing road, rail, and barge infrastructure and reported average annual daily traffic (AADT) counts taken in 1996 and 1998. Potential impacts were assessed for operation of the SCR during the ozone season. The following paragraphs provide an update of the transportation infrastructure, describe actual and projected ammonia use for the proposed action, and assess potential impacts on the transportation system in terms of year-round operation of the ALF SCRs at current and projected levels.

Traffic

The existing transportation network is unchanged since 2001, when the original EA was prepared (TVA 2001). However, the AADT counts have changed. Table 1 compares AADT values reported in 2001 and those reported/predicted for 2005, according to traffic studies performed by the City of Memphis and the Tennessee Department of Transportation (TDOT).

Table 1. Traffic Data Comparison

Location	2001 EA Data AADT (Year)	Current Data AADT (Year)
Winchester Road	11,510 (1996)	12,234[2] (2005)
U.S. Highway 61	27,320 (1998)	44,730[3] (2005)
Mitchell Road	3,260 (1996)	11,468[2] (2005)
Riverport Road	4,432[1] (2001)	5,810[4] (2005)

[1]Data not available/reported in the 2001 EA
[2]City of Memphis traffic count
[3]TDOT traffic count
[4]Data projected using a 7 percent annual increase

Ammonia Deliveries/Operation

Ammonia delivery and handling operations would be similar to those outlined in the ALF SCR EA. That EA stated that operation of the SCR would entail ammonia deliveries of approximately one truck per day, seven days per week—an additional two vehicle trips per day traveling on Riverport Road, near ALF, once the SCR began operations. Current operations during the ozone season require nine deliveries per week, or an average of 2.6

vehicle trips per day on Riverport Road (one truck per day with two trucks on the third day). Moving to year-round SCR operations would add this same number of vehicle trips during the months of October through April—an eventuality covered by the 2001 EA.

Under the Action Alternative, slip could increase beyond current levels, but the amount of slip would be limited by the need to meet existing permit compliance levels. It is estimated that the additional ammonia required for future changes in ammonia slip would not exceed one to two more trucks per week, or an additional 0.6 vehicle trips per day on Riverport Road. This would result in a total of 3.2 vehicle trips per day for year-round operation of the ALF SCRs with an increase in ammonia slip.

Conclusions

Traffic levels (AADT) as a whole have increased during the interim period since the original EA was released in 2001. The area in question is a heavily industrialized area. The move to year-round SCR operations would add traffic to the transportation network, during the months of October through April, which is currently not being experienced although it was addressed in the ALF SCR EA (TVA 2001). The number of trucks used for deliveries could increase if ammonia slip is increased. This increase is, however, almost transparent, equaling an increase in AADT of 1.2 over the number outlined in the 2001 EA and only a 0.6 increase in AADT over current operations. These increases in AADT are equivalent to 0.02 and 0.01 percent, respectively. The existing transportation network can readily absorb these increases in traffic, and therefore, the proposed action would not make any significant changes to the conclusions presented in the 2001 EA.

Solid and Hazardous Waste—Coal Combustion By-Product (CCB) Generation, Marketing, and Handling

CCB (e.g., fly ash) generation, marketing, and handling were previously described in the ALF SCR EA (TVA 2001), and were updated in more detail recently in TVA 2006b. In 2005, ALF modified its CCB handling method to include construction of a small dredge cell (TVA 2004b) within the main ash pond in order to maintain the required free water volume of 158,400 cubic yards in the ash pond. The capacity of this dredge cell is about 300,000 cubic yards. Ash dredged from the main ash pond into the dredge cell is dewatered in the cell and then excavated for use in structural fill projects (TVA 2004). Two projects have already been completed using ash reclaimed in this way, and another large project is scheduled to start in the fall of 2006 (TVA 2006b).

Although excess ammonia from the SCR system may adhere to fly ash, because the ammonia compounds in fly ash are quite readily soluble in water, the ammonia tends to rapidly disassociate from the fly ash when it is sluiced to the ash pond. Therefore, no impacts to use of fly ash in structural fill projects are anticipated under either the No Action (status quo) or the Action Alternatives.

As was discussed in the ALF SCR EA (TVA 2001), boiler slag is collected in the boiler prior to ammonia injection. Therefore, no direct, indirect, or cumulative impacts to boiler slag marketing, utilization, or disposal are anticipated under either the No Action (status quo) or the Action Alternatives.

Surface and Wastewater

Ammonia compounds released from the SCR exit either through the stack with the flue gases or with the CCBs, which in turn can release ammonia in ash pond and chemical pond discharges. The parameters of concern with regard to wastewater discharge to surface waters are (1) the concentration of ammonia that contaminates ash pond effluent (as opposed to the total annual amount discharged) and (2) its potential for toxicity to aquatic organisms. At ALF, the receiving stream is listed by the Tennessee Department of Environment and Conservation (TDEC) as impacted due to polychlorinated biphenyls, chlordane, dioxin, loss of biological integrity due to siltation, low dissolved oxygen, and Escherichia coli (TDEC 2006c).

Currently, there are no NPDES or other permit limits related to total annual weights of ammonia or nitrogen species discharged from TVA generating facilities. The ALF SCR EA (TVA 2001) states that ammonia slip would be controlled by catalyst management such that the ammonia levels in the effluent discharged from the East Ash Pond (through outfall number DSN 001) would not exceed 0.85 mg NH_3-N per liter (/L), until the West Ash Pond was brought back into service. It also states that when the West Ash Pond is reactivated, the SCR systems would not be routinely operated with an ammonia slip exceeding 2 ppmv. This commitment was based on projections made prior to SCR operation and the issuance of the NPDES permit which contains a 1 ppmv net action limit.

TVA 2001 explained that the maximum worst case concentration of ammonia in the ash pond effluent is a result of the rate of slip, effluent flow after the pond reaches a steady-state concentration, and mixing within the ash pond. Since the SCRs have become operational in 2002, sample data show that original estimates for concentrations of ammonia on ash were too conservative (i.e., original projections were for much higher levels of ammonia compounds entering the water waste stream). Those estimates of ammonia slip and fly ash interactions, which were based on available industry studies, showed that up to 80 percent of the total slip could adhere to the fly ash. Recent data from actual SCR operations show the percentage of ammonia compounds that commingle with the fly ash at ALF is roughly 30 percent.

Operational experience at ALF and monitoring results from the receiving water body, McKellar Lake, have shown that the ammonia compounds resulting from SCR operation are not negatively impacting the receiving stream with regard to ammonia-N. Figure 1 provides operational data as found during the historic operation of the SCRs. Since the SCRs have been operational, the net concentrations of nitrogen compounds at the ash pond effluent have been less than the action limit of 1 mg NH_3-N/L as required by the NPDES permit, with the exception of results obtained in December 2002. This spike in ammonia was due to a documented large migratory blackbird layover at the facility.

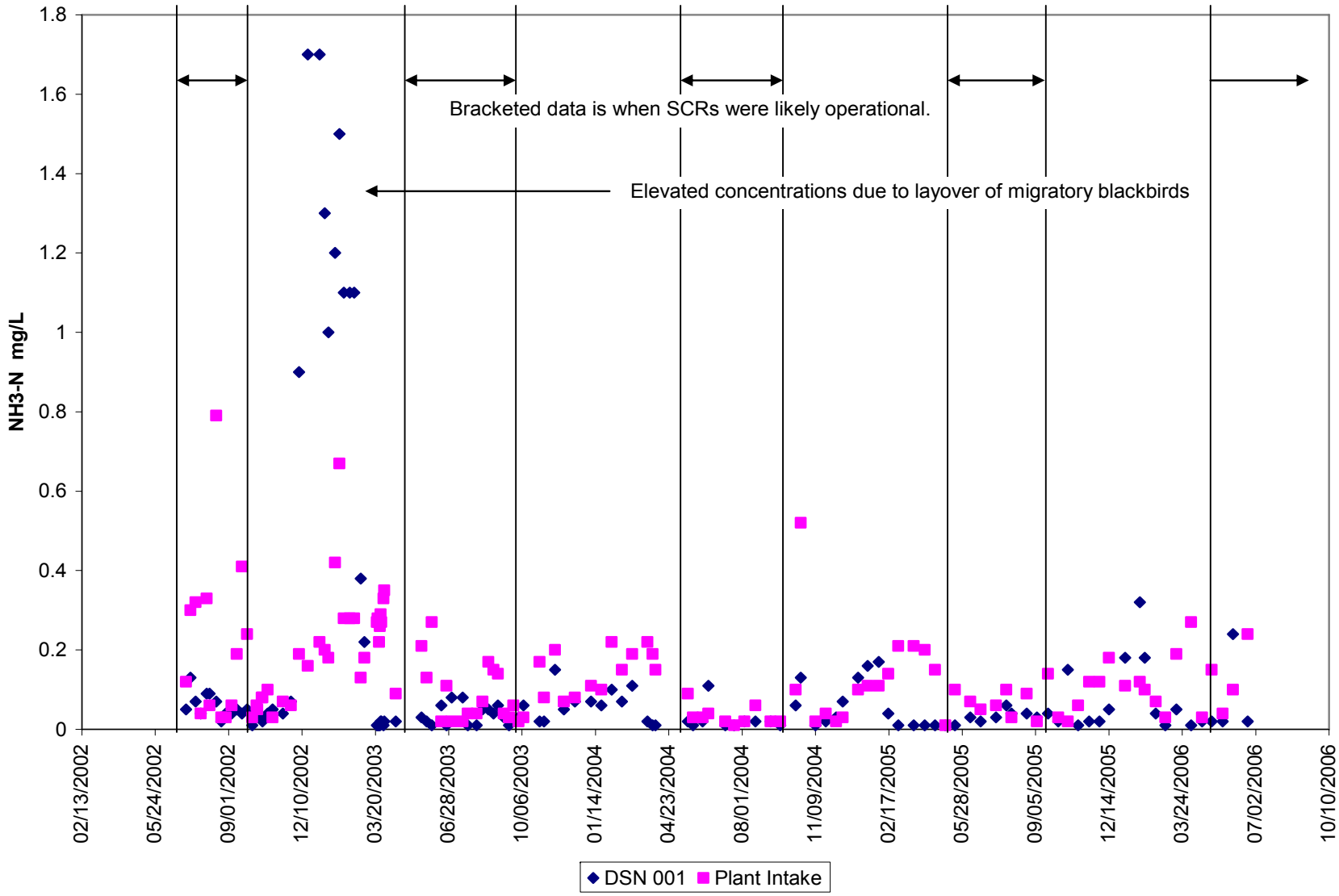

Figure 1. ALF Ash Pond Ammonia Monitoring Results

Load at the ash pond effluent at that time was attributed to bird excrement. In the case of future migratory bird layovers, if the NPDES permit NH_3-N action limit of 1 mg/L is exceeded, one or more of the following methods to document the contribution from birds would be executed. Fly ash sluice water—before it mixes with waters in the ash pond—would be monitored for ammonia-N to compare to the discharge; fecal coliform would be sampled to provide the data needed to distinguish between operational and nonoperational nitrogen loading; and/or photographs of the bird population would be taken. TVA would provide documentation of the suspected reason to the regulatory agency.

Ammonia concentrations (less than 0.4 mg NH_3-N/L, excluding concentrations attributed to the blackbird layover) in the ash pond discharge during SCR operation have also been well below toxic levels estimated from ammonia spiking studies conducted in 1999 (Table 2) and acute criteria for protection of aquatic life (Table 3). All WET studies conducted since 2000 have confirmed that no acute toxicity has been present in the ash pond discharge.

Table 2. Toxicity Endpoint Summary: Baseline and Ammonia Spiked Ash Pond Water Results (expressed as mg/L N), August 23, 1999, Sample

Parameter[1]	Baseline (percent)	pH 7.5	pH 8.0	pH 8.5
Fathead 48-h LC_{50}[2]	>100	53.4	19.3	5.3
Fathead 96-h LC_{50}[3]	>100	26.2	11.5	5.3
Daphnid 48-h LC_{50}	>100	50.5	21.0	14.5
Daphnid 96-h LC_{50}	>100	50.5	21.0	11.9

> = Greater than
[1]Based on measured concentrations
[2]48-h LC_{50} - Lethal concentration to 50 percent of the test organisms in 48 hours
[3]96-h LC_{50} - Lethal concentration to 50 percent of the test organisms in 96 hours

Table 3. Maximum Allowable Ammonia Concentrations to Protect Aquatic Life From Acute Effects at Typical pH Levels (assumes salmonids absent)

Calculated Acute Criterion (mg N/L)						
pH 6.0	pH 6.5	pH 7.0	pH 7.5	pH 8.0	pH 8.5	pH 9.0
54.99	48.83	36.09	19.89	8.41	3.20	1.32

As stated in the description of the Action Alternative, recent tests have shown that SCRs actually operate at an average 4 ppmv slip level. However, as monitoring results show, the plant has remained in compliance with its NPDES permit limits even when the SCR units have been operated at greater than 2 ppmv slip. Since the plant does not anticipate a need to operate at significantly higher slip levels, the action limit of the current NPDES permit remains adequately protective of the receiving stream with regard to aquatic organisms. On this basis, the potential for impacts to water quality and toxicity to aquatic organisms from wastewater discharges is insignificant.

The engineered features of the NO_X reduction systems, including a retention basin for spills and emergency water fogging to minimize risk of direct releases of ammonia, are adequate to meet regulatory requirements and designed to ensure safe handling of ammonia. Therefore, direct impacts from accidental releases of ammonia beyond those analyzed in the original FONSI would not be expected.

Mitigation Measures

Based on the analysis presented in this supplemental EA, routine compliance with opacity standard in TVA's air quality permit and ammonia standards in the plant's NPDES permit would be sufficient to protect air and water resources from any adverse effect that might result from operation of the ALF SCR for optimal NO_X removal performance.

Preferred Alternative and Conclusion

TVA has selected the Action Alternative as preferred, since it best meets the stated purpose and need of optimizing NO_X reductions in the SCR units at ALF while still meeting all permit and CAIR requirements for NO_X reduction. Based on this supplemental EA, TVA has determined that year-round operation of the ALF SCR systems, Units 1, 2, and 3, at slip rates higher than 2 ppmv would have minimal additional adverse impacts as compared to the impacts while operating below 2 ppmv as the plant maintains compliance with permit standards for opacity and for effluent discharge and toxicity. The overall impact of optimizing the operation of the SCR control equipment should be a net improvement in air quality, both locally and regionally.

Routine compliance with the plant's air and NPDES permits, as described above, dispenses with the need for Commitment 3 in the March 29, 2001, FONSI for the ALF SCR EA.

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